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Masnerium wellsae gen. nov., sp. nov. (Hymenoptera, Platygastridae, Sceliotrachelinae) a parasitoid of *Aleuroduplidens wellsae* Martin (Hemiptera, Aleyrodidae) in Australia

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Abstract

Masnerium wellsae Polaszek, **gen. nov.**, **sp. nov.** is described from Merbein, Victoria, Australia. It is a primary endoparasitoid of the whitefly *Aleuroduplidens wellsae* Martin, described from the same type locality with identical collection data. *Masnerium* is most closely related to the genera *Aleyroctonus* Masner & Huggert, and *Aphanomerus* Perkins, but differs from both these genera in several morphological characters that are of primary importance at genus level in the Sceliotrachelinae.

Keywords

parasitoids, taxonomy, Proctotrupomorpha, whiteflies, egg parasitoids, ooparasitoids

Introduction

Masner and Huggert's (1989) revision of the platygastroid "subfamily" formerly called Inostemmatinae is a landmark work in the taxonomy of this relatively poorly-studied group. "Platygastrids", in the broad sense, are a group of major economic importance,

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especially as parasitoids of gall midges (Diptera: Cecidomyiidae) which constitute the majority of their hosts. A handful of genera, *Platygaster*, *Synopeas*, *Leptacis* and a few others, probably contain 90% of platygastrid species. Prior to Masner and Huggert, platygastrids were divided by most authors into Inostemmatinae and Platygastrinae, based on the presence (Inostemmatinae) or absence (Platygastrinae) of a reasonably well-developed submarginal vein. Masner and Huggert (1989) showed that in these two former subfamilies, the submarginal vein is lost independently in several lineages, and is not an informative character at higher (tribe, subfamily) levels. *Masnerium*, described below, is no exception having its two closest relatives with well-developed submarginal veins in all their known species.

Masnerium is described below because its morphological character suite and host data are informative for our understanding of generic and higher relationships within this important group.

Morphological terminology broadly follows Masner and Huggert (1989) with modifications following Johnson et al. (2008). The holotype specimen was photographed initially as an unprocessed card-mount, using AutoMontage software, and later partially bleached using hydrogen peroxide and potassium hydroxide, and photographed as a slide mount in Canada Balsam. The unique holotype (dissected under six coverslips on a single microscope slide) is deposited in the Australian National Insect Collection, Canberra, Australia.

Masnerium Polaszek, gen. n.

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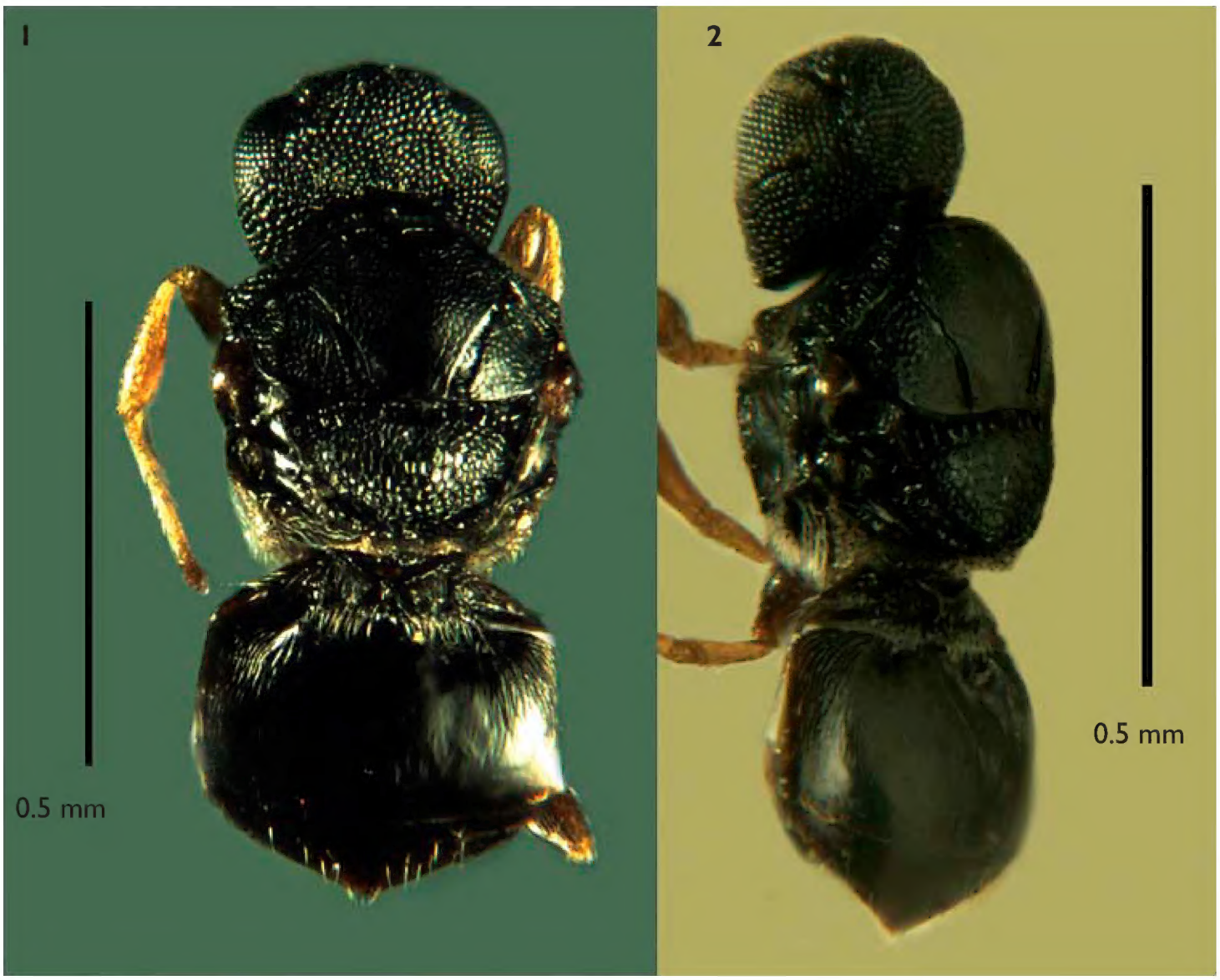
Figs 1–9

Type species: *Masnerium wellsae* gen. n. (described below), by present designation.

Description. Male: Colour: Black (melanic), legs and antennae yellow-brown, wings hyaline. Morphology: Head globose with mouthparts strongly directed backwards. Ocellar-ocular line much shorter than lateral-ocellar line, lateral ocelli contiguous with inner orbits. Eyes without setae. Malar region/gena without striae, with reticulate-coriaceous sculpture only. Clypeus small and rounded. Mandibles small. Eight antennomeres present, with compact clava (possibly fused A8-A10).

Mesosoma moderately flattened dorso-ventrally. In dorsal view appearing about 1.5× broader than head. Pronotal shoulders well-developed and angular. Notauli very well-developed, deep and broad posteriorly, narrow anteriorly, extending the length of the mesoscutum (percurrent). Parapsidal lines absent. Mesoscutellum (scutellum) approximately semicircular, with broad transscutal articulation consisting of approximately 16 large foveae. Propodeum densely setose, with foamy structures moderately developed. Wing fully-developed, without any trace of a submarginal vein; marginal cilia short. Tibial spur formula 1-1-2, with fore spur bifid and tarsal formula 5-5-5.

Metasoma short and dorsoventrally depressed, with 8 visible tergites. T1 strongly transverse, with an anterior transverse carina and a pair of central longitudinal carinae



Figures 1–2. *Masnerium wellsae* **1** Dorsal habitus **2** Dorso-lateral habitus

diverging posteriorly. T2 with two shallow transverse setose pits anteriorly. Strongly longitudinally striate laterally. T3 – T8 setose.

Female: unknown.

Derivatio nominis. Named for Lubomír Masner, pioneering expert on "proctos".

Comments. The closest relatives of *Masnerium* are *Aleyroctonus* and *Aphanomerus.* The following combination of characters makes *Masnerium* unique among these and other genera of Sceliotrachelinae: Submarginal vein completely absent (always present in *Aleyroctonus* and *Aphanomerus*); Eight antennomeres present in male (as in *Aleyroctonus* and *Aphanomerus*; 10 antennomeres in all other Sceliotrachelinae, except nine in *Allotropa*); Propodeum with some development of so-called "foamy structures" (absent in *Aleyroctonus* and *Aphanomerus*).

***Masnerium wellsae* Polaszek, gen. n.**
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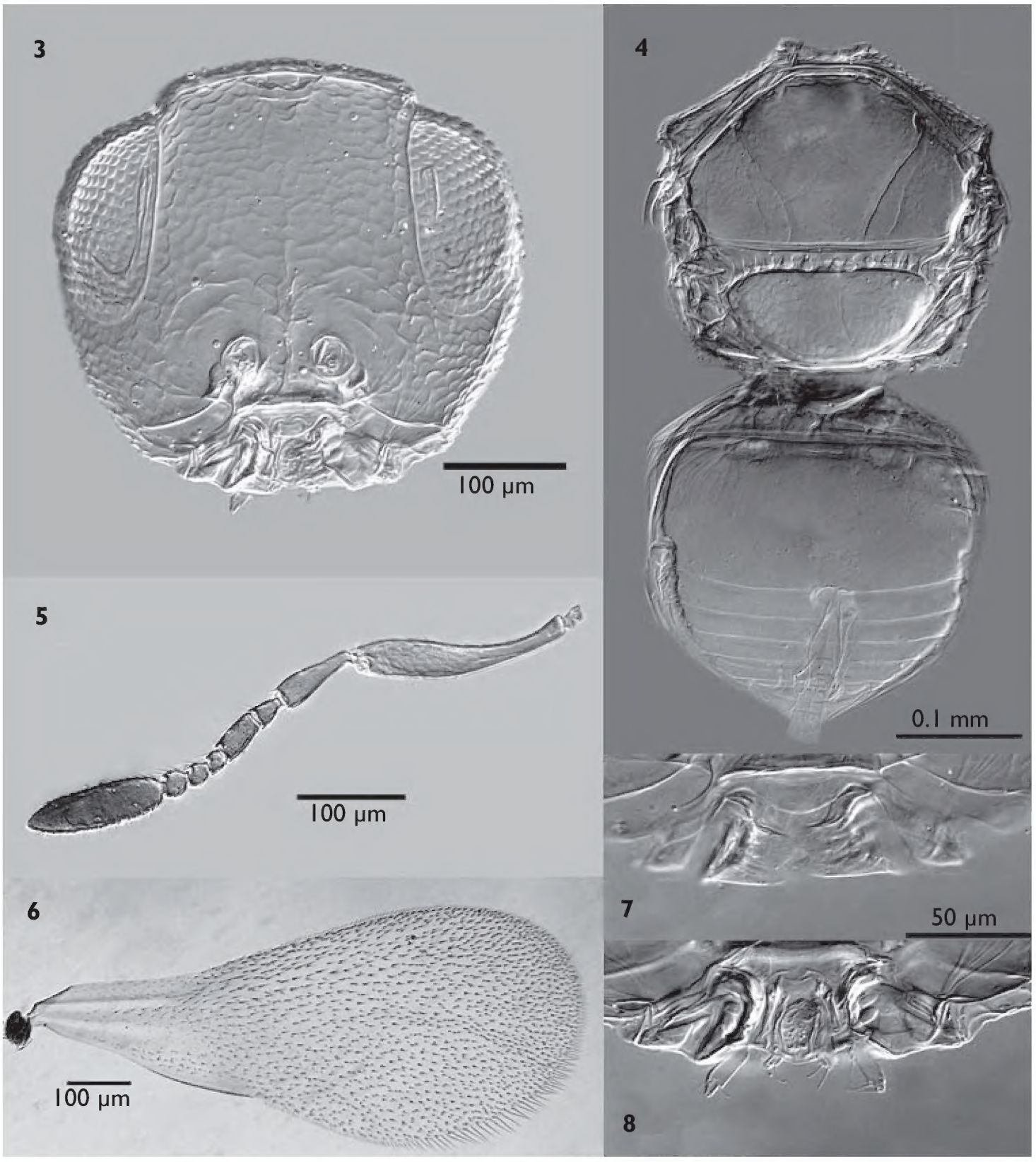
Description. Male: Length: 0.89 mm. Colour. Black (melanic), legs and antennae yellow-brown, wings hyaline.



Figures 3–8. *Masnerium wellsae* **3** Head, frontal view **4** dorsal mesosoma and metasoma **5** antenna **6** fore wing **7** detail of head showing mandibles **8** detail of head showing maxillary and labial palps

Morphology. Malar region / gena broad, approximately equal to eye width. Sculpture of occiput and malar region / gena reticulate-coriaceous. Sculpture of frons reticulate, central keel arising from the inter-antennal process to about half the eye height. Mandibles small, with two teeth, and weakly sclerotised apically. Maxillary and labial palps both 1-segmented. Antennal scape elongate, with evident reticulate sculpture, slightly shorter than A1-A8 combined. Radicle short, approximately equal in length to A6. Pedicel equal to A3+A4; A3 (F1) half the length of A4 (F2); A5-A7 the smallest flagellomeres, gradually increasing in size and each as long as broad; A8 (club / clava) composed of three (or possibly four) fused segments, without any visible sutures (as

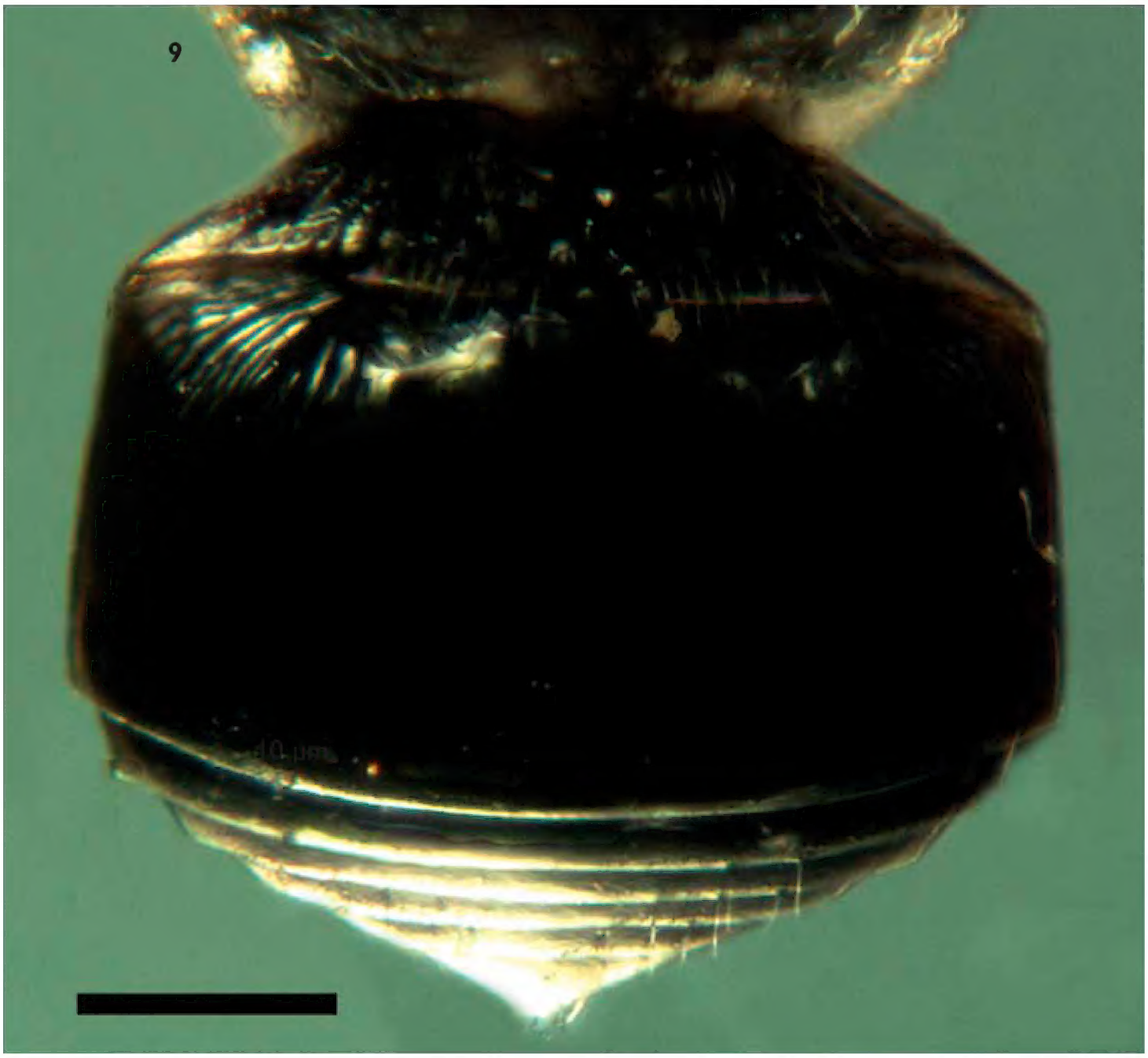


Figure 9. *Masnerium wellsae* dorsal metasoma.

in *Aleyroctonus)*. An elongate ovoid sensory area clearly present, occupying ¾ of the length of the clava (clearly present in both antennae).

Mesosoma dorso-ventrally flattened. Pronotal shoulders angular, with raised reticulate sculpture. Notauli very well-developed, deep and broad posteriorly, narrow anteriorly, extending the length of the mesoscutum. Mesoscutum with shallow reticulate sculpture, less conspicuous centrally.

Mesoscutellum (scutellum) approximately semicircular, with broad transscutal articulation consisting of approximately 16 large foveae. Propodeum densely setose, with foamy structures moderately developed. Wing fully-developed, without any trace of a submarginal vein; marginal cilia short. Tibial spur formula 1-1-2.

Metasoma short and dorsoventrally depressed, with eight visible tergites. T1 strongly transverse, with an anterior transverse carina and a pair of central longitudinal carinae diverging posteriorly (as in *Helava alticola* Masner & Huggert, 1989). T2 with two shallow transverse hairy pits anteriorly; strongly longitudinally striate laterally. T3–T8 setose. Genitalia with three teeth per digitus; aedeagal lobe apparently truncate.

Derivatio nominis. Named for Alice Wells, discoverer of this new genus and its host.

Material examined. Holotype ♂ AUSTRALIA: Victoria: Merbein South, near Mildura. 27.I.1997 (A. Wells) *ex Aleurodupidens wellsae* Martin on *Acacia melvillei* (ANIC). The holotype has been dissected and mounted under six cover slips.

Biology. *Masnerium wellsae* is a primary endoparasitoid in the larvae of the aleyrodid *Aleuroduplidens wellsae* Martin.

Discussion

The structure of the male antenna strongly indicates that *Masnerium* is clearly closely related to both *Aleyroctonus* and *Aphanomerus*. It shares with *Aphanomerus* the completely fused clava, without any traces of sutures, but the position of the claval sensilla is possibly indicative of a plesiomorphic 4-segmented clava. This would suggest a plesiomorphic 11-segmented male antenna in this lineage. *Aleyroctonus* and *Masnerium* are, as far as is known, exclusively parasitoids of Aleyrodidae.

Masner and Huggert (1989: 37, 58) drew attention to the close relationship between *Aleyroctonus* and *Aphanomerus*, although they placed them in different genus "clusters" (*Amitus*-cluster and *Aphanomerus*-cluster, respectively; Masner and Huggert, 1989: 14). This study suggests strongly that both *Aleyroctonus* and *Masnerium* are more closely affiliated to *Aphanomerus*, despite sharing the hosts of *Amitus*.

These three closely-related genera, *Masnerium*, *Aleyroctonus* and *Aphanomerus* share hemipteran hosts, albeit whitefly immatures in the case of the first two genera, and hemipteran (fulgoroid) eggs in the latter. Host-switching between insect eggs and the immature stages of sessile Sternorrhyncha (Coccoidea, Aleyrodidae and some Aphididae) appears to be very common in many lineages among the Proctotrupomorpha. Within the chalcidoid family Aphelinidae alone it has occurred at least five times (Polaszek 1991), and may also be a common phenomenon in basal platygastroids. Acquisition of hosts that are more complex than eggs, especially if this involves overcoming host defence systems, could lead to rapid radiation, with these lineages consequently preadapted for the acquisition of increasingly resistant hosts, such as the developmental stages of Holometabola.

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